

## **STRUCTURE OF ENGINE EXHAUSTER**

### **Field of the invention**

The present invention relates to a structure of engine exhauster, installing a board between front and rear case of the association when exhaust gas passes, according to Bernoulli Theorem to generate pressure differences. A check valve is disposed at the largest point of pressure difference allowing secondary air to enter from the front case of check valve and mix with exhaust gas, then gas through the honeycomb structure of the catalytic to increase catalytic efficiency, this air-gas mixture is then exhaust through holes on the rear case. This important design is to provide advantage of fast and significant air pollution reduction performance, this important engine exhauster is suitable and idea use with all gasoline-engines type gardening equipment or similar equipment.

### **Background of the invention**

In General, the engine exhauster is the most widely used have been broadly used, users and manufacturers attach great importance to application of engine exhausters. Various kinds of engine exhausters come into existence.

Most conventional structure of the engine exhauster, shown in Fig. 1, includes a front case 1, a board 2 and a rear case 3. Exhaust gas passes through the board 2 combined between the front case 1 and the rear case 3. The exhaust gas generated

enters an opening 11 of the front case 1 through a plurality of holes 21 of the board 2 and then exhales from a plurality of holes 31 of the rear case 3. Due to various air paths, noise is eliminated but air exhausted is still exhaust gas.

Moreover, the following device, a muffler for an internal combustion engine, is shown in Fig. 2, disclosed in Taiwan Patent No. 83216258. The device includes an inlet for entering air flow, at least a room therein, and a body of the muffler for exhaust the air from an outlet of an external apparatus. A pipe with a plurality of holes on one side is disposed inside the body of the muffler. The above mentioned air flow through the pipe. With the holes reaching to the pipe with a plurality of holes in the above-mentioned room and a pipe with a specific length inserted in the above-mentioned pipe with a plurality of holes, an inner portion with space is formed between the outer surface of the pipe and the inner surface of the pipe with a plurality of holes. However, although noise is eliminated, air exhausted is still exhaust gas. The air pollution issue is not improved yet.

#### **Summary of the invention**

The objective of the present invention is to provide a structure of engine exhauster. A board is used, through which exhaust gas passes, combined between the front case and the rear case, to generate a pressure difference according to

Bernoulli Theorem. A check valve is disposed in the position containing the largest pressure difference for entering secondary air from the check valve of the front case by the pressure difference generated, mixing up with exhaust gas, and then increasing the catalytic efficiency by a honeycomb portion of the board. Finally, the structure with air exhaust from holes of the rear case has advantages of firm combination and substantially air pollution reduction.

To achieve the above objective, the present invention provides a board, through which exhaust gas passes, combined between the front case and the rear case. According to Bernoulli Theorem, a pressure difference is generated. A check valve is disposed in the position containing the largest pressure difference for entering secondary air from the check valve of the front case by the pressure difference generated, mixing up with exhaust gas, and then increasing the catalytic efficiency by the beehive portion of the board. Finally, the structure with air exhaling from holes of the rear case results in firm combination, substantially air pollution reduction, increasing the usefulness.

An embodiment is described as follows for further understanding the features and structure of the present invention.

**Brief description of the drawings**

Fig. 1 shows an explosive diagram of a conventional embodiment.

Fig. 2 shows a cross-section diagram of another conventional embodiment.

Fig. 3 shows a diagram of the present invention according to an embodiment.

Fig. 4 shows an explosive diagram of the present invention according to an embodiment.

Fig. 5 shows a side-view diagram of a board of the present invention according to an embodiment.

Fig. 6 shows a combination diagram of the present invention according to an embodiment.

Fig. 7 shows a combination diagram of the present invention according to another embodiment.

Fig. 8 shows a position diagram of the present invention according to still another embodiment.

Fig. 9 shows an air flow diagram of the present invention according to the embodiment of Fig. 6.

Fig. 10 shows a position diagram of a beehive portion of the present invention according to another embodiment.

**Detailed description of the invention**

The technique, method and specific structure features applied in the present invention for achieving the above objective should be fully disclosed and understood in accordance with the following preferred exemplary embodiment and corresponding drawings.

As shown in Fig. 3 to Fig. 5, the present invention provides a structure of engine exhauster includes a front case 4, a board 5 and a rear case 6. Exhaust gas passes through the board 5 combined between the front case 4 and the rear case 6.

The front case 4 has an opening 41 for entering exhaust gas generated as a machine operates through the opening 41. The front case 4 has a secondary air inlet 42 for mounting a pipe 43. The pipe 43 passes through a check valve 44 for entering unidirectional secondary air. The rear case 6 has a plurality of holes 61.

A bending part 52 is disposed in the board 5. An opening 51 is disposed on the bending part 52. A beehive portion 53 provided with catalytic transformation ability is disposed above the bending part 52 for exhausting the exhaust gas to reduce air pollution. Furthermore, another embodiment is shown in Fig. 10 with the beehive portion 53 disposed directly on the board 5.

A structure of engine exhauster is formed with the above-mentioned devices. As shown in Fig. 3 to Fig. 6 and Fig. 9, the feature of the present invention is to use a

board 5, through which exhaust gas passes, combined between the front case 4 and the rear case 6. Exhaust gas entering from the front case 4 passing through the opening 51 of the board 5 exhales from the beehive portion 53 to each of the holes 61 of the rear case 6. According to Bernoulli Theorem, a pressure difference is generated. The check valve 44 is disposed in the position containing the largest pressure difference for entering secondary air from the check valve 44 of the front case 4 by the pressure difference generated, mixing up with exhaust gas, and then increasing the catalytic efficiency by the beehive portion 53 of the board 5. Finally, the structure with air exhaling from holes 61 of the rear case 6 results in air pollution substantially reduction and engine power augmentation under proper adjustment. The present invention has advantages of firm combination, substantially air pollution reduction, and engine power augmentation, increasing the usefulness.

Referring to Fig. 7, when use the present invention, the beehive portion 53 of the board 5 is either wound in a cylindrical shape or in a columnar shape, such as the beehive portion 54. In addition, a beehive portion with more contact area is obtained for increasing the catalytic efficiency. The present invention is suitable for all kinds of mowing machines, blowers, lumber saws, power generators, chain saws, pumps, and so forth.

The present invention generates a pressure difference according to Bernoulli

Theorem. The check valve 44 is disposed in the position containing the largest pressure difference for entering secondary air from the check valve 44 of the front case 4 by the pressure difference generated, mixing up with exhaust gas, and then increasing the catalytic efficiency by the beehive portion 53 of the board 5. In addition, the present invention can also provide secondary air by electronic pump or engine to further mix up with exhaust gas.

Fig. 8 shows a view of an engine outlet 71 of the engine 7 and an exhaust manifold 73 connecting to the exhaust manifold inlet 72. The opening 41 of the front case 4 connects to the exhaust manifold outlet 74 of the exhaust manifold 73. The secondary air inlet 75 of the present invention, the pipe 76, and the check valve 77 are disposed on the exhaust manifold 73. The exhaust gas of engine enters the exhaust manifold 73 via engine outlet 71. The secondary air enters through the check valve 77, the pipe 76, and the secondary air inlet 75 and mixes up with the exhaust gas. The exhaust gas passes through the exhaust manifold outlet 74 and the opening 41 of the front case 4 and then the beehive portion 53 of the board 5 to increase the catalytic efficiency. Finally, air exhales from the holes 61 of the rear case 6 and improves the air pollution issue substantially. Accordingly, the present invention is of the following advantages:

1. The present invention generates a pressure difference according to Bernoulli

Theorem. A check valve is disposed in the position containing the largest pressure difference for entering secondary air from the check valve of the front case by the pressure difference generated, mixing up with exhaust gas, and then increasing the catalytic efficiency by the beehive portion of the board. Finally, air exhales from the holes of the rear case and improves the air pollution issue substantially.

2. The present invention provides a board, through which exhaust gas passes, combined between the front case and the rear case. The advantages of the present invention are firm combination and noise elimination.

From the detail description mentioned above, while the invention has been described in connection with what is presently considered to be the most practical and preferred embodiments, it is to be understood that the invention is not to be limited to the discovered embodiments. The invention is intended to cover various modifications and equivalent arrangement included within the spirit and scope of the appended claims. The advantages of the present invention are firm combination, air pollution reduction, and engine power augmentation. The present invention is useful and patentable.